

PORTLAND HARBOR RI/FS

**APPENDIX J**

**COMPENSATORY MITIGATION REQUIREMENTS UNDER  
CWA SECTION 404**

**PORTLAND HARBOR FEASIBILITY STUDY**

**DRAFT FINAL**

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## J1.0 INTRODUCTION

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This memorandum provides a discussion of requirements under the Clean Water Act (CWA) Section 404 to compensate for anticipated losses to aquatic habitat from the proposed remedial alternatives for the Portland Harbor Superfund Site. Compliance with the CWA is an action-specific Applicable or Relevant and Appropriate Requirement (ARAR). Specifically, Section 404(b)(1) of the CWA requires that alternatives be designed to avoid or minimize adverse impacts to aquatic resources and waters of the United States. Compensatory mitigation is considered only after other appropriate and practicable options have been considered to avoid, minimize, or otherwise rectify unavoidable, adverse impacts to the aquatic environment, including impacts to aquatic species.

The purpose of this memo is to help inform the detailed analysis of alternatives in the Feasibility Study (FS) by outlining a general framework for quantifying habitat effects and developing cost estimates that would be fully evaluated as part of a design process once the remedial alternative is selected. Previous analyses of compensatory mitigation for the Portland Harbor site and for the T4 Confined Disposal Facility (CDF) are discussed in this memo.

## J2.0 BACKGROUND

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Unavoidable impacts to wetlands and waters of the U.S. during remediation of the Portland Harbor Site are anticipated to include temporary and/or permanent loss of shallow water habitat, riparian habitat, and alteration of substrate, in addition to effects during construction such as turbidity, direct harm or disturbance, or loss of benthic community.

The importance of retaining shallow water habitat and riverbank vegetation was established during development of the remedial alternatives as described in Section 3 of the FS, as follows:

- An engineered beach mix layer would be applied to the uppermost layer of all caps in nearshore areas. This layer provides habitat and stability of the cap.
- Assuming a cap thickness of 3 feet and a mean low-low water (MLLW) elevation of 7 feet NAVD88, material would be placed such that residual elevation is at or below 4 feet NAVD88 and remains submerged at the MLLW.
- Armored caps are assumed to be placed at riverbanks with steep slopes and at riverbanks in the main channel that are prone to erosive forces. Vegetation is assumed to be used for riverbanks in off-channel areas that are not prone to erosion and with slopes less than 1.7H:1V. When practicable, the use of vegetation would be an avoidance or minimization measure.

Even with implementation of these measures, it is anticipated that remediation of the Portland Harbor Site will result in unavoidable impacts to waters of the United States,

authorized under a CWA Section 404 permit from the U.S. Army Corps of Engineers (USACE). These losses will be offset by compensatory mitigation, which entails the restoration, establishment, enhancement, and/or preservation of wetlands, streams, or other aquatic resources conducted specifically for the purpose of offsetting authorized impacts to these resources.

The USACE and the Oregon Department of State Lands are responsible in Oregon for determining the appropriate form and amount of compensatory mitigation required. Methods of compensatory mitigation include restoration, establishment, enhancement and, in some cases, preservation. Oregon Administrative Rules (OAR 141-85-135) stipulate that restoration will be credited at a ratio of 1:1, creation at a ratio of 1.5:1, and enhancement at a ratio of 3:1. There are three mechanisms for achieving the four methods of compensatory mitigation (listed in order of preference as established by the regulations): mitigation banks, in-lieu fee programs, and permittee-responsible mitigation.

In 2008, EPA and USACE issued revised regulations governing compensatory mitigation (FR 70: 19594-19705). The regulations emphasized identifying mitigation obligations based on replacing habitat functions instead of using strict ratios of the amount of habitat lost to the amount of habitat replaced. The regulations define credits as “a unit of measure (e.g., a functional or areal measure or other suitable metric) representing the accrual or attainment of aquatic functions at a compensatory mitigation site. The measure of aquatic functions is based on the resources restored, established, enhanced, or preserved.”

### **J3.0 CWA 404(B)(1) EVALUATION**

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#### **J3.1 EVALUATION STEPS**

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The required evaluation steps set forth in the CWA 404(b)(1) are outlined below and consist of a series of questions by which the proposed action(s) was evaluated:

1. Is the proposed action a water-dependent use?

The remedial alternatives evaluated in the draft FS address nearshore and offshore sediment contamination that is located within potentially jurisdictional waters; therefore, the sediment remediation is a water-dependent activity (40 CFR §230.10).

2. What are the alternatives to the proposed action?

EPA is required to examine other practicable alternatives to the proposed discharge, which may include not discharging at all (40 CFR §230.5). The alternatives being evaluated in the FS consist of a range of options for implementing the proposed action. Alternative B may be considered the practicable alternative with the least environmental impact on the aquatic ecosystem compared to the other alternatives. Alternative B has a smaller footprint than the other alternatives, though it uses the same remedial technologies. Alternative A (No Action) is not considered to be available per

40 CFR 230.10 because it does not meet the purpose and need of the remedial action, to remediate contaminated sediments to reduce potential risks to acceptable levels consistent with the remedial action objectives.

The remedial alternatives are described in detail in Section 3 of the FS. Section 4 of the FS provides the detailed evaluation of the alternatives. Impacts to the environment are discussed throughout these criteria, while impacts during construction are evaluated most directly under Short-term Effectiveness.

3. What are the avoidance and minimization measures?

As described above, protection of shallow water and riverbank habitat were considered in development of the alternatives. Additional avoidance and minimization measures would be implemented to reduce adverse effects during construction, such as the use of environmental/closed buckets and other best management practices to be implemented during dredging. Once the proposed remedy is selected, specific measures to be implemented during construction and long-term operation, maintenance, and monitoring would be outlined through the Section 404 permit process, in conjunction with Section 401 Water Quality Certification, and compliance with Section 7 of the Endangered Species Act (ESA).

4. What are the unavoidable impacts and how will the project compensate for them?

Unavoidable impacts include the following:

- ☐ Short-term water quality degradation due to construction activities that disturb sediments and potentially increase turbidity and/or cause the re-suspension of contaminants in the water column.
- ☐ Disturbance to the substrate and benthic community that may serve as prey sources for listed species from dredging, in-place technologies, or construction of CDFs.
- ☐ Increase of in-water noise levels from construction activities associated with piling removal and reinstallation.
- ☐ Direct harm to listed species during construction (e.g., entrainment in dredging equipment and/or in materials being placed within a CDF, or as part of in-place technologies activities).
- ☐ Habitat alteration and loss associated with dredging, fill, in-place technologies, or construction of CDFs.
- ☐ Vegetation clearing or habitat alteration of riverbanks.

A detailed discussion of impacts on listed species and critical habitat will be provided in a Biological Assessment to be developed for the proposed remedy in compliance with Section 7 of the ESA. Conservation measures will be required to avoid or mitigate

impacts during construction. Unavoidable impacts due to alteration or loss of habitat will require compensatory mitigation, as described below.

### **J3.2 FS MITIGATION ASSUMPTIONS AND COST EVALUATION**

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The alternative evaluation process followed during development of the FS considered measures to avoid or minimize loss of aquatic habitat or function. However, if a loss was deemed unavoidable, then mitigation was included as part of the alternative. The final assessment of loss and determination of mitigation measures will be made during Remedial Design.

In the FS, a simplified approach was used to determine the extent of mitigation that could be required under each alternative and to develop mitigation cost estimates. Given the importance of shallow water and riverbank habitat, it was assumed that shallow water and riverbank areas having cap and dredge technology assignment would have unavoidable impacts that would require compensatory mitigation. These acreages were totaled and then multiplied by a unit cost for mitigation, which was based on previous mitigation projects conducted in the Lower Duwamish Waterway (Appendix X- Detailed Cost Evaluation).

### **J3.3 REMEDIAL DESIGN PHASE COMPENSATORY MITIGATION FRAMEWORK AND COST EVALUATION**

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As part of the CWA 404(b)(1) evaluation, a more detailed mitigation framework was developed to provide a basic approach for determining required compensatory mitigation for use in the Remedial Design to support sediment management area (SMA)-specific decisions using additional field-collected data to inform the functional impact and to determine the site-specific mitigation requirements. During Remedial Design, cost estimates for compensatory mitigation will be provided for the actual construction of a project that assumes creation of active channel margin (ACM) or shallow water habitat from existing upland with sand/gravel substrates, shallow slopes, and shoreline complexity.

Although the 2008 EPA and USACE Compensatory Guidance states a preference for addressing compensatory mitigation requirements through the purchase of mitigation banking credits and in-lieu fee credits before permittee-led mitigation projects (USACE and EPA 2008), there are currently no operational mitigation bank within the Portland Harbor service area which could be used to develop costs for purchased credits (USACE 2015). Credit costs for Portland Harbor will be developed if a mitigation bank with credits in the Lower Willamette River service area is approved, or an in-lieu fee program is established for the purposes of addressing CWA compensatory mitigation.

Several habitat quantification methods (calculators) were considered in development of the mitigation framework, including the Oregon Rapid Wetland Assessment Protocol; Counting on the Environment Salmon Calculator; Oregon Department of Transportation Habitat Value Method; Combined Habitat Assessment Protocols; Hydrogeomorphic

Approach; Habitat Equivalency Analysis; California Rapid Assessment Method; Western Washington Wetland Assessment Protocol; and a number of state and local mitigation/restoration strategies.

In coordination with the National Marine Fisheries Service (NMFS), a Habitat Equivalency Analysis (HEA) method was used to develop the mitigation framework. HEA compares existing habitat functions to proposed habitat functions (i.e., after remediation) within the same area using relative habitat values (RHVs). The difference between existing and proposed function represents either a mitigation credit (an increase in ecological function) or debit (a decrease in ecological function that would require compensatory mitigation).

The HEA method quantifies wetland resources using RHV scoring developed by the Portland Harbor Natural Resource Trustee Council and NMFS (PHNRTC 2012). Habitat characteristics include type and extent of riparian habitat, slope and substrate of the ACM, depth and substrate of the main channel area, and characteristics of off-channel habitat.

To score existing habitat condition, GIS information for water depth, substrate type and shoreline complexity (slope and large woody debris) would be used for each of the SMAs. Information on riparian vegetation or large woody debris and shoreline slope would be incorporated, where available. Post-remedial action habitat condition would be assessed in the same manner, and the difference in scores would be used to estimate the acres of compensatory mitigation that would be required.

Cost estimates would then be developed for compensatory mitigation on-site (within the Site) and off-site (outside the Site within the fourth order HUC watershed), as needed. The cost estimates would consider engineering design work, permitting, mitigation construction, project and construction management, long-term monitoring and maintenance (10 years), contingencies, long-term financial assurances for management in perpetuity, and land acquisition.

### **J3.4 EXAMPLE CDF EVALUATION**

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As with other technology assignments, construction of a CDF would result in unavoidable impacts that would require compensatory mitigation. The Port of Portland prepared a CWA Section 404(b)(1) Analysis for the proposed CDF at Terminal 4 (T4). The Port's evaluation included an estimate of the important habitat types for salmon that could be lost with construction of the T4 CDF. These are shown in the table below (Table Q-2 from Appendix Q, the Draft CWA Section 404(b)(1) Analysis Memorandum for Terminal 4 Removal Action; BBL 2005). It was determined that construction of the CDF in Slip 1 would result in the loss of 15.3 acres of total aquatic area, including approximately 3.1 acres of shallow water (<20 feet deep), 11.5 acres of deepwater, 0.2 acres of vegetated shallows or wetlands, 3.5 acres of inundated piling areas, and 3,317 linear feet of shoreline, which is comprised of various structures, unclassified fill, seawalls, and riprap. Of the habitats potentially affected by construction of a CDF, the

<20 foot depth was considered the most important habitat for salmon and other aquatic species.

**Table Q-2**  
**Summary of Existing and Potentially Affected Habitat for Each Project Subarea**  
**Terminal 4 Removal Action Area**

Existing Conditions	Slip 1	Slip 3	Wheeler Bay	North of Berth 414	Berth 401	Total Habitat Type
<20 ft Water Depth (acres)	3.1	1.7	4	0.8	1.4	11
>20 ft Water Depth (acres)	11.5	11.7	1.2	1.4	1.2	27
<20 ft Water Depth, <20% Slope (acres)	0	0	3.2	0	0.6	3.8
Inundated Pilings (acres)	3.5	3	0	0	0.8	7.3
Overhead Pier Structures (acres)	1.6	1.8	0	0	0.5	3.9
Total Shoreline Length (ft)	3,317	1,875	1,120	775	779	7,866
Bank Type: structures length (ft)	2,776	1,523	0	696	432	5,427
Bank Type: unclassified fill length (ft)	425	352	765	0	347	1,890
Bank Type: seawall length (ft)	0	0	0	79	0	79
Bank Type: riprap length (ft)	116	0	364	0	0	470

The CDF was not constructed, but the T4 Phase I Removal Action project was conducted at Wheeler Bay. As part of that removal action, the following habitat mitigation actions were conducted:

- ☐ Planting of willow and cottonwood live stakes within the ACM across the Wheeler Bay site.
- ☐ Placement of large woody debris within the ACM in specific sections of Wheeler Bay.
- ☐ The placement of sand-gravel habitat material over placed riprap armor and the demonstration through previous and ongoing monitoring that the sand-gravel surface remains over much of the Wheeler Bay area.

In addition, due to the need to place riprap armor in Wheeler Bay for shoreline stability, the Biological Opinion (NMFS 2008) and Supplemental 404(b)(1) Evaluation (EPA 2008) identified the need for compensatory mitigation for impacts to critical habitat for federally listed salmon species and aquatic habitat. Compensatory mitigation was required for the placement of riprap over 0.33 acres of shoreline habitat in Wheeler Bay. EPA adjusted the required acreage with a mitigation ratio of 1.5:1.0 and accounted for the loss of sand and gravel habitat mix from the riprap after 2 years and for the delay between the impact and the construction of a mitigation project. The final compensatory mitigation acreage required was determined to be 0.41 acres.

To meet the Port's mitigation requirements for the T4 Phase I Removal Action project, Dahl Beach Mitigation, LLC in conjunction with the Port, is proposing to restore 0.52 acres located near the confluence of the Clackamas and Willamette Rivers in Gladstone, Oregon. The Dahl Beach Mitigation project includes two components: the restoration of a portion of a parking area and the restoration of a failed bulkhead constructed of sheet pile and riprap nearby. Both areas are owned by the City of Gladstone and are managed as park lands. In addition, three other potential sites along the Lower Willamette River have been proposed for use as a mitigation site (Anchor QEA 2013). The general concepts include enhancement and/or preservation within the ACM. Enhancement activities could include removal of invasive species, planting of native species, removal of pilings and debris, and removal of riprap. Preservation would entail permanently protecting the area using an appropriate real estate or other legal mechanism.

## **J4.0 CONCLUSION**

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During alternative evaluation at the FS stage, a simplified approach was used that assumed cap and dredge within shallow water areas and riverbanks would result in unavoidable impacts that would require compensatory mitigation (Section 3.2). This approach meets CWA 404 requirements (an identified ARAR) and was used to develop high-level cost estimates for the proposed alternatives.

The Remedial Design phase compensatory mitigation framework described in Section 3.3 provides an approach for habitat quantification and cost estimation that would be conducted during Remedial Design once the remedial alternative is selected. At the Remedial Design stage, avoidance and mitigation measures would be fully developed for each SMA and additional SMA-specific data collection would be conducted as needed to quantify existing and proposed habitat conditions. That information would be evaluated to determine the required compensatory mitigation and refine cost estimates.

During Remedial Design, use of the HEA method and RHV scoring approach as described in the compensatory mitigation framework would be verified through consultation with NMFS.

## **J5.0 REFERENCES**

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- Anchor QEA. 2013. Terminal 4 Phase I Removal Action—Potential Alternate Mitigation General Descriptions. Memorandum to Sean Sheldrake, EPA. October 31.
- Blasland, Bouck & Lee, Inc. (BBL). 2005. Appendix Q – Draft Clean Water Act Section 404(b)(1) Analysis Memorandum, Terminal 4 Removal Action, Port of Portland. Portland, Oregon.
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Portland Harbor Natural Resource Trustee Council (PHNRTC). 2012. Relative Chinook Salmon Lower Willamette Habitat Values.

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